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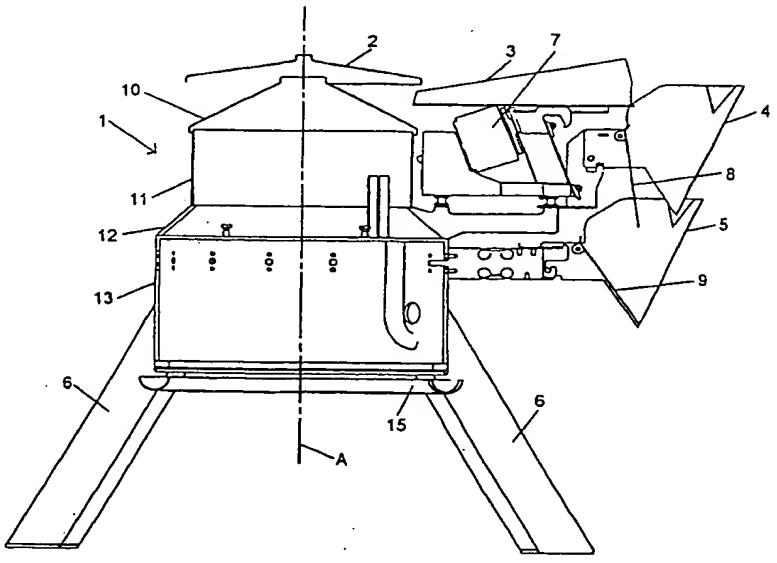

(57) Abstract

A weighing machine for weighing off batches of material, said weighing machine comprising a frame on which a central distributor, a plurality of transporters and a plurality of scales are mounted, and wherein the transporters are arranged around the central distributor and configured with a view to transporting material from the distributor and radially outwards from the central distributor and to the scales, and wherein the weighing machine comprises one or more substantially uninterrupted shields in the form of screen faces that extend from a point underneath the distributor and outwards and downwards underneath at least that end of the transporters that faces towards the central distributor in the respective position of use of the machine.

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A weighing machine

The present invention relates to weighing machines for weighing off batches of material, said weighing machines comprising a steel construction on which a central distributor, a plurality of transporters and a plurality of scales are mounted, and wherein the transporters are arranged around the central distributor and configured with a view to transporting material from the distributor and radially outwards from the central distributor and to the scales.

Today such weighing machines are used essentially for forming batches of bulk material of a weight that is very close to a desired reference weight such that the batches can be transferred to eg a packaging machine that packages the individual batches.

Such weighing machines that are often designated combination weights operate in that each of the scales are, by means of the transporters, filled with a batch portion of the bulk material that was initially supplied to the central distributor and then, via the central distributor, transferred to the individual transporters. The individual batch portion is subsequently weighed off the bulk product into the individual scales, and by means of a calculator or computer the scales are found that combine to contain a bulk product that is close to the desired reference weight. Finally the calculator is configured to effect that the thus identified scales are emptied to form the total batch of the bulk product, and since it is possible to continuously form and identify combinations of scales that combine to contain the desired amount, such machines enable very elevated production rates while

generating a large number of material batches exhibiting very small variations in their weight.

However, it is a problem in connection with the prior art machines to be used for this purpose that it is necessary to configure the central distributor as well as the individual transporters such that there is a certain amount of clearance there between, and since there is often a considerable amount of the bulk material present in these parts of the machine, practice has shown that it is difficult to avoid that material, be it individual loose objects or fluid, passes through the clearances present between the central distributor and the transporters, and between the transporters as such.

Thus, in case of the prior art machinery it is often necessary to perform regular cleaning of the machine, such material constituents being susceptible to deposit on the frame parts of the machine with for instance an ensuing sanitary hazard.

In the light of this it is the object of the present invention to provide a weighing machine of the kind described above whereby such sanitary hazards have been completely or partially overcome.

According to the invention this is obtained in that the weighing machine comprises one or more substantially uninterrupted shields in the form of screen faces that extend from somewhere underneath the distributor and outwards and downwards below at least that end of the transporter that faces towards the central distributor, seen in the operative position of the machine.

According to a preferred embodiment of the invention the transporters of the weighing machine is configured such that they comprise a groove with a first end that faces towards the central distributor and a second, open end that faces towards one or more scales; and wherein the groove is delimited by two lateral edges that extend between the first and the second open ends.

The screen faces in the weighing machine can preferably comprise frustoconical or upwardly convex, rounded faces that can be configured from a plate material in a simple manner.

To this end, the screen faces may advantageously comprise cylindrical faces that extend from a frustoconical face and downwards from the lower edge thereof whereby the screen face can be configured such that its distance from the central distributor, the transporters and for instance scales can be adapted in such a manner that material that drops onto the screen face does not drop too rapidly.

Particularly advantageously a collector groove is configured at the lower edge of the screen faces with a view to collecting material that drops from the distributor or the transporters, and that will - via the screen faces - be conveyed down into the collector groove. Hereby cleaning of the machine, if to be performed, is enabled with liquids without the liquids continuing down into a subjacent packing machine, if any, and that for instance liquids from the bulk material portioned in the machine and that run down through the clearances, eg between the individual transporters and the central distributor, do not drip into the packaging machine or the packagings.

In this context the collector grooves advantageously features an outlet in particular for liquids that are collected in the collector groove.

According to a further preferred embodiment of the invention the screen faces constitute a part of the weighing machine's frame construction, and the central distributor, the transporters and/or the scales are mounted on the screen face by means of fittings intended therefor. Hereby it is possible - with the screen faces - to construct an extremely vibration-free shell construction that will support the individual constituents that are mounted thereon in a stable manner.

To this end the fittings can advantageously be configured such that they permit material that runs or slides down the screen face to run or slide past the fitting, an in accordance with a particularly simple embodiment of the fittings, they comprise substantially planar plate flanges that are secured to the screen face in such a manner that the plane of the plate flange extends substantially vertically or slantingly downwards.

Advantageously, the weighing machine comprises a computer ia for collecting weighing data from the scales and for controlling the transporters; and wherein at least a part of the weighing machine computer is arranged below the screen face thereby avoiding a considerable amount of wirings from an external computer and which also means that the computer is still well shielded against soiling and humidity.

Further advantageously a number of liquid nozzles can be configured above the screen face, said nozzles being connected to a conduit for liquids with a view to sweeping and cleaning the screen face with cleaning liquid. This enables extremely simple cleaning of the machine when necessary.

According to an embodiment that is particularly suitable for portioning material that consists of solid components the screen face can extend substantially uninterrupted from a point underneath the central distributor and out underneath the other end of the grooves. This is due to the fact that primarily the solid components have a tendency to travel out between the spaces that are located between the individual transporters and the screen face will thereby effectively catch such solid components.

The invention will now be described in further detail in with reference to the drawings, wherein

Figure 1 is a principle sketch that outlines, in a sectional view through the centre axis of the machine, a weighing machine according to the invention, seen from the side;

Figure 2 is a perspective sectional view that shows the weighing machine shown in Figure 1 in an inclined top plan view in the vertical sectional plane through the centre axis of the machine;

Figure 3 is a principle sketch that illustrates an alternative embodiment of the invention, seen from the side.

Thus, Figures 1 and 2 illustrate a weighing machine 1, said weighing machine 1 comprising - like the commonly known weighing machines for combination weighing material - a central distributor 2, an number of transporters 3 provided with grooves 14, a number of portioning dishes 4 and a corresponding number of scales 5. For the sake of clarity the drawing shows only one transporter 3, one portioning dish 4 and one scale, but - as is commonly known within the field of combination weighing machines - a fully mounted weighing machine comprises a plurality of such that are arranged peripherally and circularly around the central distributor. Thus the machine is constructed essentially symmetrically about its centre axis A and as shown it comprises a number of legs 6 that support the frame of the machine.

The functioning of the weighing machine 1 is such that an amount of the bulk material to be portioned is deposited on the central distributor 2. This could comprise appliances such as nails, screws, nuts, etc, or they may be foodstuffs, such as candies, wine gums, fish or cheese.

By means of the central distributor 2 the bulk material is distributed to the individual transporters 3. This can be accomplished by the bulk material sliding on the central distributor, but very often special means are used to ensure this distributor, such as a vibrator (not shown in the drawing) that is configured for imparting to the central distributor a spiral movement about the central axis A of the weighing machine.

When the bulk material from the central distributor 2 reaches each of the transporters they will, by means of eg a linear vibration motor 7, ensure that the bulk mate-

rial is moved outwards towards the peripherally arranged portioning dishes 4 that are filled at least partially with a portion of the bulk material. Since each of the portioning dishes 4 is provided with an activatable flap 8, this portion of the bulk material can be transferred to the scale 5 that is located underneath the portioning dish 4, said scale being provided with (not shown) means for weighing the transferred portion; and wherein the bottom of the scale 5 is configured with an activatable flap 9 whereby the scale can be emptied.

Since there are several such transporters, portioning dishes and scales it is thus clear that the above-mentioned functionality can, by means of convenient control - for instance computer aided - carry out repeated weighing and discharge operations of individual portions of the bulk material, and by combination of two or more of the portions, portions exhibiting very small variations relative to a desired weight can be obtained.

According to the invention the machine shown in Figure 1 is provided with a shield 10,11,12,13, said shield comprising an upper frustoconical face 10 that extends, at its lower end, into an upper circular cylindrical face 11 that yet again, at its lower end, extends into a further lower frustoconical face 12 that finally extends into a lower circular cylindrical face 13 on which the legs 6 of the machine are mounted.

In this manner it is ensured that liquids, if any, that are emitted from the bulk material on the weighing machine during the weighing procedure and that optionally collects in the grooves 14 of the transporters 3 and run towards the centre axis A of the weighing machine will

proceed down onto the upper frustoconical face 10 and then down the shield 10,11,12,13 such that it is readily ensured that the liquid is collected and does not continue into the (not shown) packing machine that is optionally arranged underneath the weighing machine 1.

Preferably such collection of the liquids is, according to the embodiment shown in Figures 1 and 2, established by means of a collector groove 15 wherein there is optionally mounted an outlet stub for ready emptying the collector groove 15, if necessary.

The weighing machine shown in Figures 1 and 2 is particularly suitable for weighing off products or bulk material wherein liquid is discharged, or where dust or the like is emitted that can be humidified by the atmospheric air and thus form a liquid substance. Since a liquid that is optionally discharged will primarily collect at the bottom of the groove, the liquid will either run towards the portioning dishes and very likely be included in the weighing process, or else it will run towards the centre axis A and collect as explained above.

Since it is a rare occurrence in itself that the liquid will drip from the lateral edges on the grooves 14 in the transporters it is not necessary to provide a shield that covers underneath the entire length of the transporters.

Then, Figure 3 illustrates an alternative embodiment of a weighing machine according to the invention that is particularly suitable for weighing bulk material that consists of relatively small, hard individual components. As will appear the weighing machine 20 shown in Figure 3 is constructed in accordance with the same principles as the

weighing machine shown in Figures 1 and 2 and the constituents of this machine are thus shown with the same reference numerals as the machine shown in Figure 1 and 2 and thus no further explanation of the functionality of the machine will be given here.

The embodiment shown in Figure 3, however, is particular in that the shield 10 extends underneath a considerable part of the length of the transporters 3 thereby enabling the shield 10 to collect individual components, if any, that drop between the transporters 3. Thus the substantially frustoconical shield 10 forms a chute that ensures that there is only a very small risk of the individual components remaining on the frame of the weighing machine or any other constituents.

As will appear, a convenient embodiment of the invention provides a frame portion 16 that extends across the shield 10 at a distance there from and thereby permits individual components from the bulk material to slide underneath the frame portion 16. As shown this frame portion can be configured as an annular tube and thereby it is also possible, as shown, to arrange a number of spray nozzles 17 that can, via the tube, be supplied with pressurized cleaning liquid thereby enabling simple cleaning of the shield 10 by sweeping thereof.

Besides, the embodiment of the invention shown in Figure 3 distinguishes itself from the one shown in Figures 1 and 2 in that a collector groove is not provided at the lower edge of the shield, which means that constituents, if any, from the bulk material is not collected therein and removed, but that such constituents will be conveyed down into the packing machine and be included in a batch

that has already been weighed, and in this context a not shown chute can conveniently be configured that conveys the individual components down into one of the scales such that these components are still included in the weighed-off portion.

As will appear from the figures, the shield 10,11,12 and 13 will form a space below them wherein, according to a preferred embodiment, major constituents for the machine can be arranged, such as control unit or computer optionally configured for activating the transporters 3, the flaps 8 and 9 of the portioning dishes 4 and the scales, and optionally for carrying out the requisite combination calculations that are carried out in such combination weighing machines. Hereby it is possible to avoid a large number of the cablings and wirings and the cleaning problems associated therewith that are conventionally encountered in connection with conventional combination weighing machines as a consequence of their having a separate computing unit located a distance from the weighing machine as such.

Obviously the fundamental principle of the present invention is useful in other embodiments of combination weighing than the ones shown in Figures 1, 2 and 3.

C l a i m s

1. A weighing machine for weighing off batches of material, said weighing machine comprising a frame portion on which a central distributor, a plurality of transporters and a plurality of scales are mounted, and wherein the transporters are arranged around the central distributor and configured with a view to transporting material from the distributor and radially outwards from the central distributor and to the scales, **characterised in** that the weighing machine comprises one or more substantially uninterrupted shields in the form of screen faces that extend from a point underneath the distributor and outwards and downwards underneath at least that end of the transporters that faces towards the central distributor in the operative position of the machine.

2. A weighing machine according to claim 1, **characterised in** that each of the transporters comprises a groove with a first end that faces towards the central distributor and another open end that faces towards one or more scales, and wherein the groove is delimited by two lateral edges that extend between the first and the second open end.

3. A weighing machine according to claim 1 or 2, **characterised in** that the screen faces comprises frustoconical faces that are made of a plate material, and that at the bottom the screen faces end in a relatively sharp edge with a view to forming a drop catcher for liquid, if any, that runs down the screen faces.

4. A weighing machine according to claim 3, **characterised in** that the screen faces further comprise cylindrical

faces that extend from a frustoconical face and downwards from its lowermost edge.

5. A weighing machine according to one of the preceding claims, **characterised in** that, at the lowermost edge of the screen faces, a collector groove or a collector tray is configured with a view to collecting material that drops from the distributor or transporters and that will, via the screen faces, proceed into the collector groove.

6. A weighing machine according to claim 5, **characterised in** that an outlet from the collector groove is configured in particular for liquids that are collected in the collector groove.

7. A weighing machine according to any one of claims 1 through 4, **characterised in** that the screen faces constitute a part of the frame construction of the weighing machine, and wherein the central distributor, the transporters and/or the scales are mounted on the screen face by means of fittings intended therefor.

8. A weighing machine according to claim 7, **characterised in** that the fittings are configured such that they permit material that runs or slides down the screen face to run or slide past the fitting.

9. A weighing machine according to claim 8, **characterised in** that the fittings comprise substantially plane plate flanges that are attached to the screen face in such a manner that the plane of the plate flange extends substantially vertically or slantingly downwards.

10. A weighing machine according to any one of the preceding claims, **characterised in** that the weighing machine comprises a computer ia for collecting weighing data from the scales and for controlling the transporters, and wherein at least a part of the weighing machine computer is located underneath the screen face.

11. A weighing machine according to any one of the preceding claims, **characterised in** that a number of liquid nozzles are configured underneath the screen face, said nozzles being connected to a liquid conduit with a view to sweeping and cleaning the screen face with cleaning liquid.

12. A weighing machine according to claim 2, **characterised in** that the screen face extends substantially uninterrupted from a place underneath the central distributor and out below the other end of the grooves.

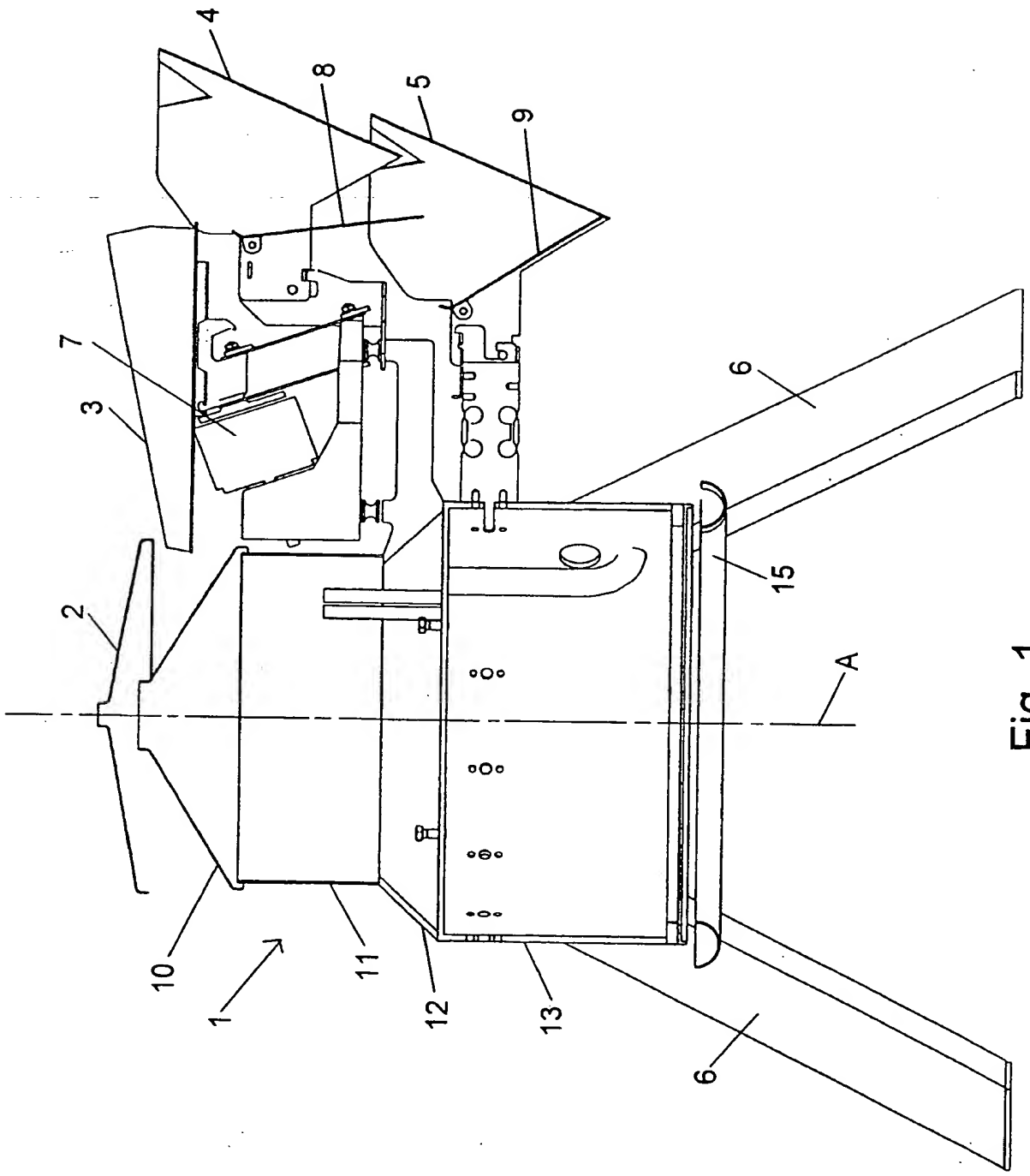

Fig. 1

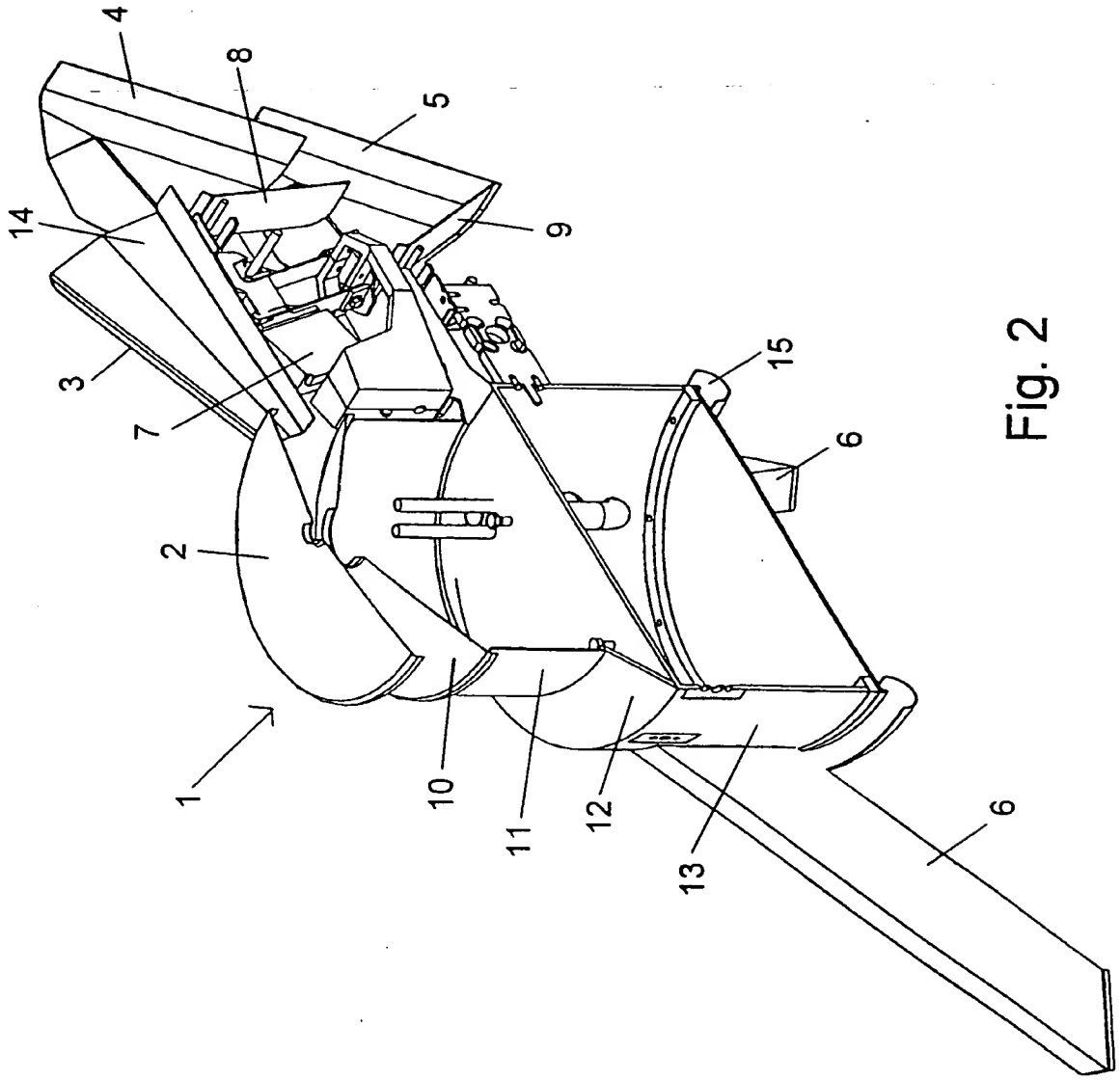

Fig. 2

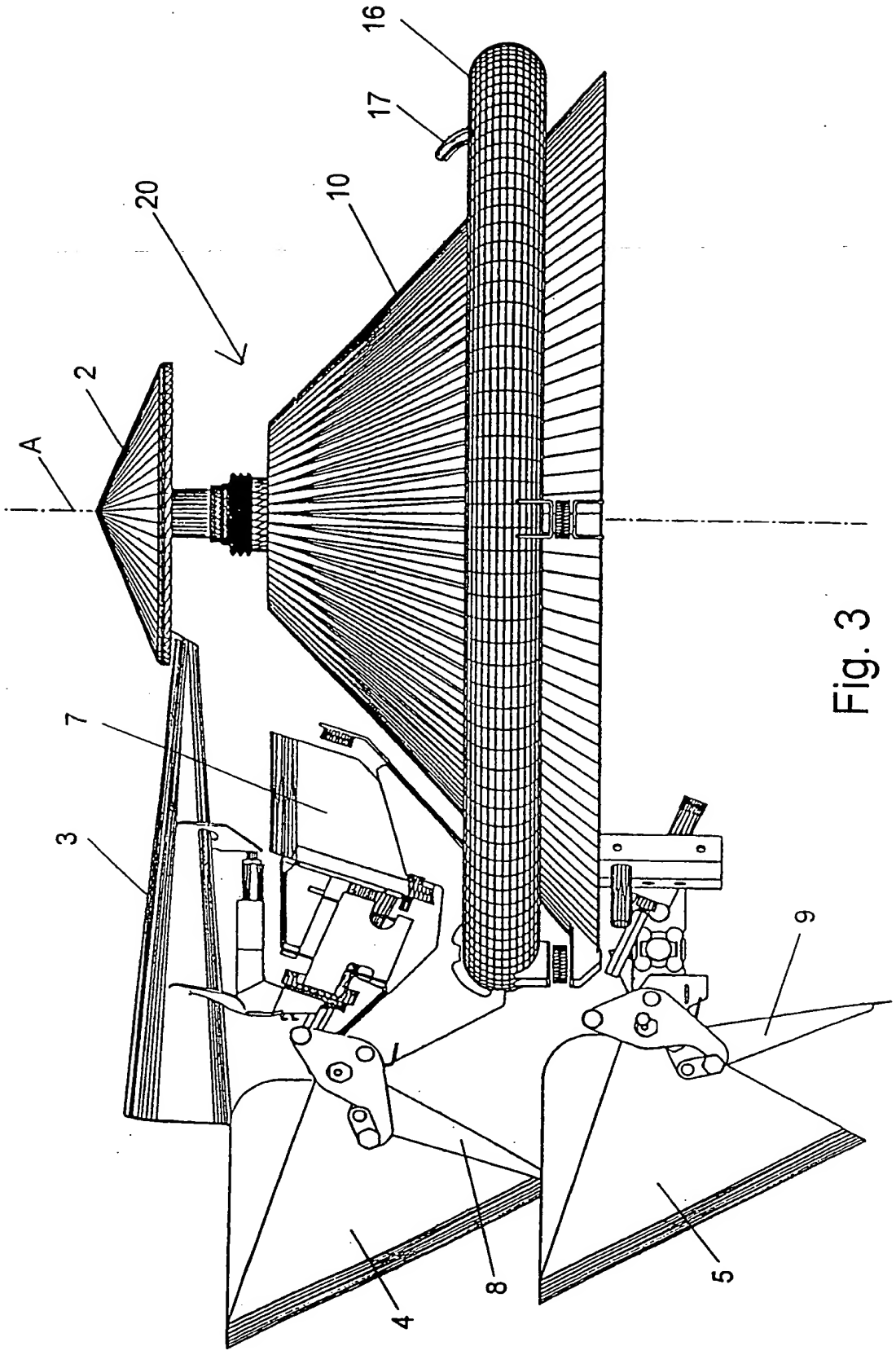

Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK 00/00220

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G01G 13/02, G01G 19/32, G01G 21/28
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: G01G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4683966 A (Y. NAKAGAWA ET AL), 4 August 1987 (04.08.87), column 11, line 43 - line 51, figures 11,12	1-12
A	US 4171067 A (K. FAULKNER ET AL), 16 October 1979 (16.10.79), column 3, line 13 - line 22, figure 3	1-12
A	US 5613590 A (P. SIMIONATO), 25 March 1997 (25.03.97), figure 1, abstract	1-12
A	US 5038875 A (K. KITAGAWA ET AL), 13 August 1991 (13.08.91), abstract, figures 1,9	1-12

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/DK 00/00220

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4683966 A	04/08/87	AU 575997 B	11/08/88
		AU 4765985 A	27/03/86
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		EP 0362567 A,B	11/04/90
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		JP 2167434 A	27/06/90

Vejemaskine

Den foreliggende opfindelse vedrører vejemaskiner til afvejning af portioner af materiale, hvilke vejemaskiner omfatter en stelkonstruktion hvorpå der er monteret en central fordeler, et flertal af transportører samt et flertal af vejeskåle, og hvor transportørerne er placeret omkring den centrale fordeler og er indrettet med henblik på at transportere materiale fra fordeleren og radialt udad fra den centrale fordeler og til vejeskålene.

Sådanne vejemaskiner anvendes i dag i hovedsagen til at danne portioner af bulkmateriale som har en vægt der ligger meget tæt ved en ønsket referencevægt, således at portionerne kan overføres til f.eks. et pakkeapparat som emballerer de enkelte portioner.

Disse vejemaskiner, som ofte kaldes for kombinationsvægte, fungerer på den måde at hver af vejeskålene, ved hjælp af transportørerne, fyldes med en delportion af bulkmaterialet som indledningsvist er tilført til den centrale fordeler og herefter via den centrale fordeler, er overført til de enkelte transportører. Herefter vejes den enkelte delportion af bulkvaren i de enkelte vejeskåle, og ved hjælp af en regnemaskine eller computer, fremfindes de vejeskåle som tilsammen indeholder bulkvare der ligger tæt på den ønskede referencevægt. Til sidst er regnemaskinen indrettet til at aktivere at de derved fremfundne vejeskåle tømmes til dannelse af den samlede portion af bulkvaren, og idet der løbende kan dannes og fremfindes kombinationer af vejeskåle som tilsammen indeholder den ønskede vægt, så kan der ved disse maskiner opnås meget

store produktionshastigheder ved dannelse af mange materialeportioner med meget lille variation i vægten.

Et problem ved de kendte maskiner til dette formål er dog at det er nødvendigt at udforme såvel den centrale fordeler, som de enkelte transportører således at der en vis lysning mellem disse, og idet der ofte befinder sig en betragtelig mængde af bulkmaterialet på disse dele af maskinen, er det i praksis vanskeligt at undgå at materiale, det være sig enkelte løse emner eller væske, passerer gennem de lysninger der forefindes mellem den centrale fordeler og transportørerne, og mellem transportørerne indbyrdes.

Ved de kendte maskiner er det derfor ofte nødvendigt at gennemføre en jævnlig rengøring af maskinen, idet disse materialedele kan lægge sig på maskinens steldele med for eksempel hygiejniske problemer til følge.

Det er på denne baggrund formålet med den foreliggende opfindelse at tilvejebringe en vejemaskine af den indledningsvist anførte art, hvormed disse hygiejneproblemer er helt eller delvist afhjulpet.

Dette opnås ifølge opfindelsen ved at vejemaskinen omfatter en eller flere i hovedsagen ubrudte afskærmninger i form af skærmflader der strækker sig fra et sted under fordeleren og udad og nedad under i det mindste den ende på transportørerne der, i maskinens arbejdsposition, vender mod den centrale fordeler.

Ved en foretrukket udførelsesform for opfindelsen, er vejemaskinens transportører udformet således at de omfatter en rende med en første ende der vender mod den

centrale fordeler, samt en anden åben ende der vender mod en eller flere vejeskåle, og hvor renden afgrænses af to sidekanter der strækker sig mellem den første og den anden åbne ende.

Skærmfladerne i vejemaskinen kan fortrinsvis omfatte keglestubformede eller opadtil konvekse afrundede flader som på enkel vis kan udformes i pladematériale.

Skærmfladerne, kan dertil fordelagtigt omfatte cylindriske flader der strækker sig fra en keglestubformet flade og nedad fra dennes underste kant, således at der skærmfladen kan udformes således at dens afstand fra den centrale fordeler, transportørerne og f.eks. vejeskåle kan tilpasses på en sådan måde at materiale der falder ned på skærmfladen, ikke falder med alt for stor hastighed.

Det er specielt fordelagtigt såfremt der ved underkanten af skærmfladerne er indrettet en opsamlingsrende med henblik på at opsamle materiale som falder ned fra fordeleren eller transportørerne, og som via skærmfladerne ledes ned i opsamlingsrenden. Dette muliggør en evt. rensning af maskinen med væsker, kan foretages uden at væskerne løber videre ned i en evt. underliggende pakkemaskine, og at eksempelvis væsker fra det bulkmateriale der portioneres i maskinen, og som løber ned gennem lysningerne mellem f.eks. de enkelte transportører og den centrale fordeler, ikke drypper ned i pakkemaskinen eller i emballagerne.

I denne sammenhæng kan det endvidere være fordelagtigt såfremt der fra opsamlingsrenden er indrettet et afløb for specielt væsker som opsamles i opsamlingsrenden.

I en yderligere foretrukket udførelsesform for opfindelsen udgør skærmfladerne en del af vejemaskinens stelkonstruktion, og den centrale fordeler, transportørerne og/eller vejeskålene er monteret på skærmfladen ved hjælp af dertil indrettede beslag. Herved vil der med skærmfladerne kunne opbygges en særdeles vibrationsfri skalkonstruktion som stabilt vil understøtte de enkelte delkomponenter der monteres herpå.

Beslagene kan dertil fordelagtigt være indrettet således at de tillader materiale som løber eller glider ned af skærmfladen at løbe eller glide forbi beslaget, og ved en specielt enkel udførelse af beslagene omfatter disse i hovedsagen plane pladeflanger der er fastgjort til skærmfladen på en sådan måde at pladeflangens plan i hovedsagen strækker sig lodret eller skråt nedad.

Vejemaskinen kan fordelagtigt omfatte en computer til bl.a. opsamling af vejedata fra vejeskålene, samt til at styre transportørerne, og hvor i det mindste en del af vejemaskinens computer er placeret under skærmfladen, således at der herved opnås at en væsentlig mængde af ledningsføringer fra en eksternt placeret computer undgås, og at computeren alligevel er godt afskærmet mod tilsmudsning og fugt.

Der kan endvidere fordelagtigt være indrettet et antal væskedyser over skærmfladen, hvilke dyser er forbundet med en væskeledning med henblik på at bestryge og rense skærmfladen med rensevæske. Dette muliggør en særdeles enkel rensning af maskinen når dette er nødvendigt.

Skærmfladen kan i en udførelsesform, som specielt er egnet ved portionering af materiale der består af faste komponenter, strække sig i hovedsagen ubrudt fra et sted under den centrale fordeler og ud under den anden ende på renderne. Dette skyldes at de faste komponenter primært har en tendens til at passere ud mellem de mellemrum der befinder sig mellem de enkelte transportører, og at disse faste komponenter derved effektiv vil opfanges af skærmfladen.

Opfindelsen beskrives nærmere i detaljer i det følgende under henvisning til tegningen, hvor:

Fig. 1 er en skitsetegning der i et snitplan gennem maskinens centerakse, viser en vejemaskine ifølge opfindelsen set fra siden.

Fig. 2 er en perspektivisk snittegning der viser den på fig. 1 viste vejemaskine set skråt ovenfra i det lodrette snitplan gennem maskinens centerakse.

Fig. 3 er en skitsetegning der illustrerer en alternativ udførelsesform for opfindelsen set fra siden.

På fig. 1 og 2 illustreres således en vejemaskine 1, hvilken vejemaskine 1, ligesom almindeligt kendte vejemaskiner til kombinationsafvejning af materiale, omfatter en central fordeler 2, et antal med render 14 forsynede transportører 3, et antal portioneringsskåle 4 og et tilsvarende antal vejeskåle 5. På tegningen vises af hensyn til overskueligheden alene en transportør 3, en portioneringsskål 4 og en vejeskål, men som det er almindeligt kendt ved kombinationsvejemaskiner omfatter en fuldt monteret vejemaskine et flertal af disse

placeret perifert i en cirkel omkring den centrale fordeler. Maskinen er således i hovedsagen opbygget symmetrisk omkring sin centerakse A og den omfatter som vist et antal ben 6 som understøtter maskinens stel.

Funktionen af vejemaskinen 1 er således at der på den centrale fordeler 2 aflægges en mængde af det bulkmateriale som ønskes portioneret. Dette kan f.eks. være brugsgenstande såsom søm, skruer, møtrikker o.s.v. eller der kan være tale om levnedsmiddelgenstande såsom bolcher, vingummi, fisk eller ost.

Ved hjælp af den centrale fordeler 2 fordeles bulkmaterialet ud til de enkelte transportører 3. Dette kan ske ved at bulkmaterialet glider på den centrale fordeler, men ofte anvendes der specielle midler til at sikre denne fordeling, såsom en vibrator (ikke vist på tegningen), som er indrettet til at bibringe den centrale fordeler en spiralbevægelse omkring vejemaskinens centrale akse A.

Når bulkmaterialet fra den centrale fordeler 2 når ud til hver af transportørerne, vil disse ved hjælp af eksempelvis en lineærvibrationsmotor 7 sikre at bulkmaterialet bevæges udad mod de perifert anbragte portioneringsskåle 4, som fyldes i det mindste delvist med en portion af bulkmaterialet. Idet portioneringsskålene 4 hver er forsynet med en aktiverbar klap 8, kan denne portion af bulkmaterialet overføres til vejeskålen 5 som er placeret under portioneringsskålen 4, hvilken vejeskål er forsynet med (ikke viste) midler til afvejning af den overførte portion, og hvor der i bunden af vejeskålen 5 er indrettet en aktiverbar klap 9, hvorved vejeskålen kan udtømmes.

Idet der er adskillige sådanne transportører, portioneringsskåle og vejeskåle, er det således klart at den ovennævnte funktion med en hensigtsmæssigt styring såsom en computerstyring, kan foretage gentagne afvejninger og udtømninger af enkelte portioner af bulkmaterialet, og ved at kombinere to eller flere af portionerne vil der kunne dannes portioner med meget små variationer i forhold til en ønsket vægt.

Ifølge opfindelsen er den på fig. 1 viste maskine forsynet med en afskærmning 10, 11, 12, 13, hvilken afskærmning omfatter en øvre keglestubformet flade 10, som ved sin nedre ende går over i en øvre cirkulærcylindrisk flade 11, som igen ved sin nedre ende går over i en yderligere nedre keglestubformet flade 12, som til sidst går over i en nedre cirkulærcylindrisk flade 13, hvorpå maskinens ben 6 er monteret.

På denne måde sikres det at evt. væsker under vejeprocessen afgives fra bulkmaterialet på vejemaskinen som evt. samler sig i transportørerne 3 render 14 og løber ind mod vejemaskines centerakse A, vil løbe ned på den øvre keglestubformede flade 10, og derefter ned ad afskærmningen 10, 11, 12, 13, således at det er let at sikre at væsken kan opsamles og ikke løber ned i den evt. nedenunder vejemaskinen 1 placerede (ikke viste) pakkemaskine.

Denne opsamling af væskerne kan ifølge den på fig. 1 og 2 viste udførelsesform fortrinsvis etableres ved hjælp af en opsamlingsrende 15, hvortil der evt. kan være monteret en afløbsstuts, således at opsamlingsrenden 15 let kan tømmes om nødvendigt.

Den på fig. 1 og 2 viste vejemaskine egner sig specielt til afvejning af produkter eller bulkmateriale, hvor der afgives væske, eller hvor der afgives støv eller lignende som kan befugtes af den atmosfæriske luft og derved danne en flydende substans. Idet en væske der evt. afgives, primært vil samle sig i rendens bund, vil væsken enten løbe ud mod portioneringsskålene og med stor sandsynlighed indgå i vejeprocessen, eller også vil den løbe ind mod centeraksen A og blive opsamlet som forklaret ovenfor.

Idet der således alene sjældent forekommer at væsken vil dryppe ned fra sidekanterne på renderne 14 i transportørerne, er det ikke nødvendigt at tilvejebringe en afskærmning der dækker under transportørernes fulde længde.

På fig. 3 illustreres derimod en anden udførelsesform for en vejemaskine ifølge opfindelsen, som egner sig specielt til afvejning af bulkmateriale der udgøres af relativt små hårde enkelte komponenter. Som det ses er den på fig. 3 viste vejemaskine 20 opbygget i hovedsagen efter samme princip som vejemaskinen der er vist på fig. 1 og 2, og delkomponenterne i denne maskine er således vist med samme figurnummerering som den på fig. 1 og 2 viste maskine, hvorfor der ikke her skal forklares yderligere omkring maskinens funktion.

Den på fig. 3 viste udførelsesform er dog speciel ved at afskærmningen 10 strækker sig ud under en væsentlig del af transportørernes 3 længde, således at afskærmningen 10 vil kunne opsamle evt. enkelte komponenter som falder ud mellem transportørerne 3. Således danner den i hovedsagen

keglestubformede afskærmning 10 en slidske som sikrer at der alene er en meget lille risiko for at de enkelte komponenter vil blive liggende på vejemaskinens stel eller andre delkomponenter.

Som det ses, er der ved en hensigtsmæssig udførelsesform for opfindelsen tilvejebragt en steldel 16, som strækker sig hen over afskærmningen 10 i en afstand fra denne, og derved tillader at enkelte komponenter fra bulkmaterialet vil glide under steldelen 16. Denne steldel kan som vist udføres som et rundtgående rør, og derved kan der endvidere som vist placeres et antal sprøjtedyser 17, som via røret kan forsynes med rensevæske under tryk, således at afskærmningen 10 kan renses på enkel vis ved afspulning af denne.

Den på fig. 3 viste udførelsesform for opfindelsen adskiller sig endvidere fra den på fig. 1 og 2 viste, ved at der ikke er tilvejebragt en opsamlingsrende ved afskærmningen nedre kant, således at evt. komponenter fra bulkmaterialet ikke her opsamles og fjernes, men at disse komponenter vil ledes ned i pakkemaskine og medgå i en allerede afvejet portion, og i denne sammenhæng kan der fordelagtigt indrettes en ikke vist slidske som fører de enkelte komponenter ned i en af vejeskålene, således at disse komponenter stadig indgår i den afvejede portion.

Som det ses på figurerne, så vil afskærmningen 10, 11, 12 og 13 danne et rum under sig, hvor der ifølge en foretrukket udførelsesform kan placeres væsentlige delkomponenter til maskinen, såsom en styringsenhed eller computer som er indrettet til evt. at aktivere transportørerne 3, portioneringsskålenes 4 og vejeskålenes 5 klapper 8 og 9, samt til evt. at foretage

de nødvendige kombinationsberegninger som foretages i sådanne kombinationsvejemaskiner. Derved kan der overflødiggøres en stor del af de kabel og ledningsføringer og de tilhørende rengøringsproblemer som ofte traditionelt ses i forbindelse med kendte kombinationsvejemaskiner som følge af at disse har en separat placeret regneenhed placeret et stykke væk fra selve vejemaskinen.

Det er klart at den foreliggende opfindelses grundprincip kan tage anvendelse i andre udførelsesformer for kombinationsvejemaskiner end de der vises i figur 1, 2 og 3.

P a t e n t k r a v

1. Vejemaskine til afvejning af portioner af materiale, hvilken vejemaskine omfatter en stelkonstruktion hvorpå der er monteret en central fordeler, et flertal af transportører samt et flertal af vejeskåle, og hvor transportørerne er placeret omkring den centrale fordeler og er indrettet med henblik på at transportere materiale fra fordeleren og radialt udad fra den centrale fordeler og til vejeskålene, k e n d e t e g n e t ved, at vejemaskinen omfatter en eller flere i hovedsagen ubrudte afskærmninger i form af skærmflader der strækker sig fra et sted under fordeleren og udad og nedad under i det mindste den ende på transportørerne, der vender mod den centrale fordeler, i maskinens arbejdsposition.

2. Vejemaskine ifølge krav 1, k e n d e t e g n e t ved, at hver af transportørerne omfatter en rende med en første ende der vender mod den centrale fordeler, samt en anden åben ende der vender mod en eller flere vejeskåle, og hvor renden afgrænses af to sidekanter, der strækker sig mellem den første og den anden åbne ende.

3. Vejemaskine ifølge krav 1 eller 2, k e n d e t e g - n e t ved, at skærmfladerne omfatter keglestubformede flader som er udført i plademateriale, samt at skærmfladerne nederst afsluttes i en relativt skarp kant med henblik på at danne dråbefang for evt væske, der løber ned ad skærmfladerne.

4. Vejemaskine ifølge krav 3, k e n d e t e g n e t ved, at skærmfladerne yderligere omfatter cylindriske flader der strækker sig fra en keglestubformet flade og nedad fra dennes underste kant.

5. Vejemaskine ifølge et af foregående krav, k e n d e - t e g n e t ved, at der ved underkanten af skærmfladerne er indrettet en opsamlingsrende eller opsamlingsbakke med henblik på at opsamle materiale som falder ned fra fordeleren eller transportørerne, og som via skærmfladerne ledes ned i opsamlingsrenden.

6. Vejemaskine ifølge krav 5, k e n d e t e g n e t ved, at der fra opsamlingsrenden er indrettet et afløb for specielt væsker, som opsamles i opsamlingsrenden.

7. Vejemaskine ifølge et af kravene 1 til 4, k e n d e - t e g n e t ved, at skærmfladerne udgør en del af vejemaskinens stelkonstruktion, og hvor den centrale fordeler, transportørerne og/eller vejeskålene er monteret på skærmfladen ved hjælp af dertil indrettede beslag.

8. Vejemaskine ifølge krav 7, k e n d e t e g n e t ved, at beslagene er indrettet således at de tillader materiale som løber eller glider ned af skærmfladen at løbe eller glide forbi beslaget.

9. Vejemaskine ifølge krav 8, k e n d e t e g n e t ved, at beslagene omfatter i hovedsagen plane pladeflanger, der er fastgjort til skærmfladen på en sådan måde, at pladeflangens plan i hovedsagen strækker sig lodret eller skråt nedad.

10. Vejemaskine ifølge et af foregående krav, k e n d e - t e g n e t ved, at vejemaskinen omfatter en computer til bl.a. opsamling af vejedata fra vejeskålene samt til

at styre transportørerne, og hvor i det mindste en del af vejemaskinens computer er placeret under skærmfladen.

11. Vejemaskine ifølge et af foregående krav, k e n d e - t e g n e t ved, at der er indrettet et antal væskedyser over skærmfladen, hvilke dyser er forbundet med en væskeledning med henblik på at bestryge og rense skærmfladen med rensevæske.

12. Vejemaskine ifølge krav 2, k e n d e t e g - n e t ved, at skærmfladen strækker sig i hovedsagen ubrudt fra et sted under den centrale fordeler og ud under den anden ende på renderne.

Sammendrag:

Vejemaskine til afvejning af portioner af materiale, hvilken vejemaskine omfatter et stel hvorpå der er monteret en central fordeler, et flertal af transportører samt et flertal af vejeskåle, og hvor transportørerne er placeret omkring den centrale fordeler og er indrettet med henblik på at transportere materiale fra fordeleren og radialt udad fra den centrale fordeler og til vejeskålene, og hvor vejemaskinen omfatter en eller flere i hovedsagen ubrudte afskærmninger i form af skærmflader der strækker sig fra et sted under fordeleren og udad og nedad under i det mindste den ende på transportørerne der vender mod den centrale fordeler, i maskinens arbejdsposition.

Fig. 1

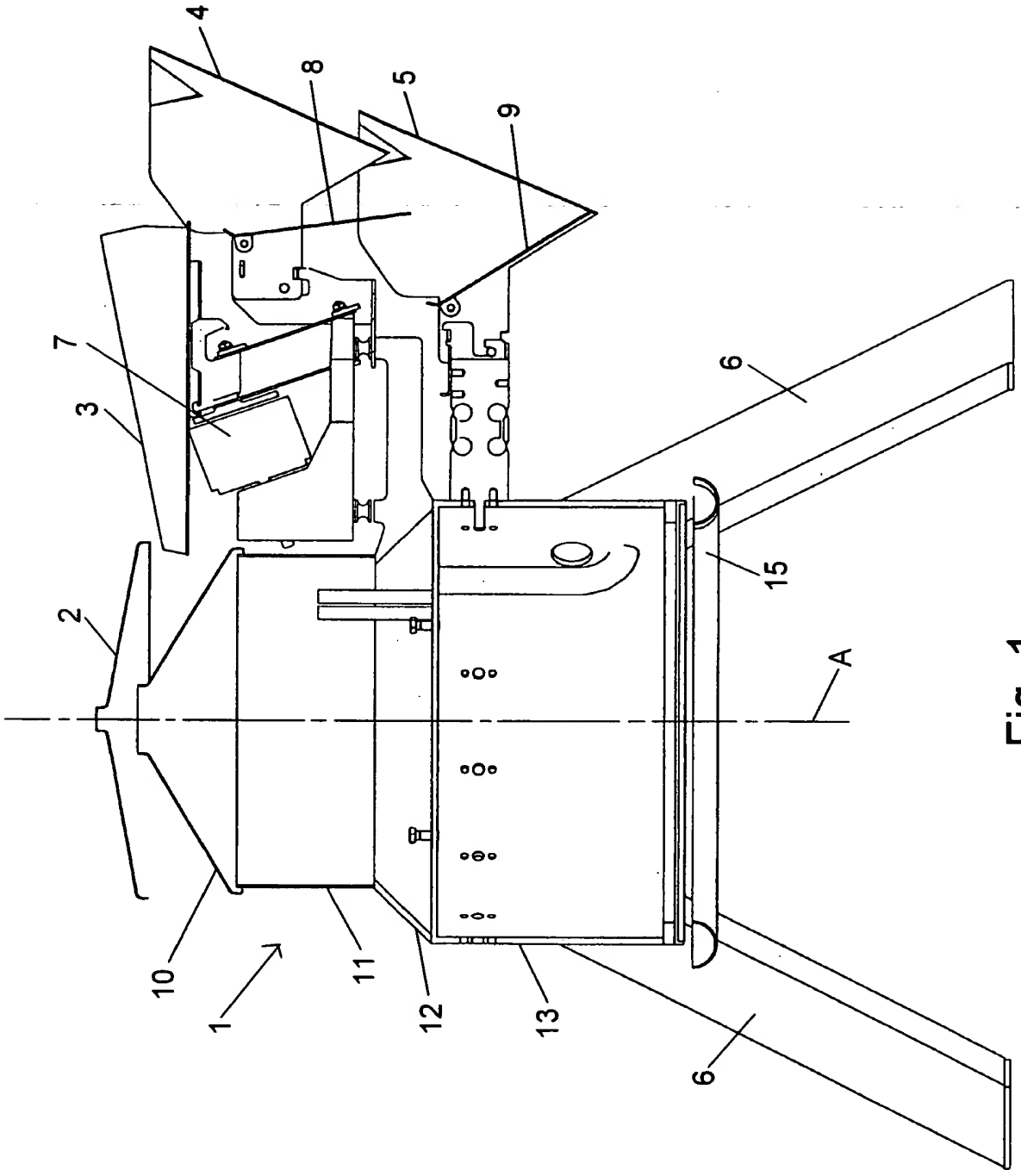

Fig. 1

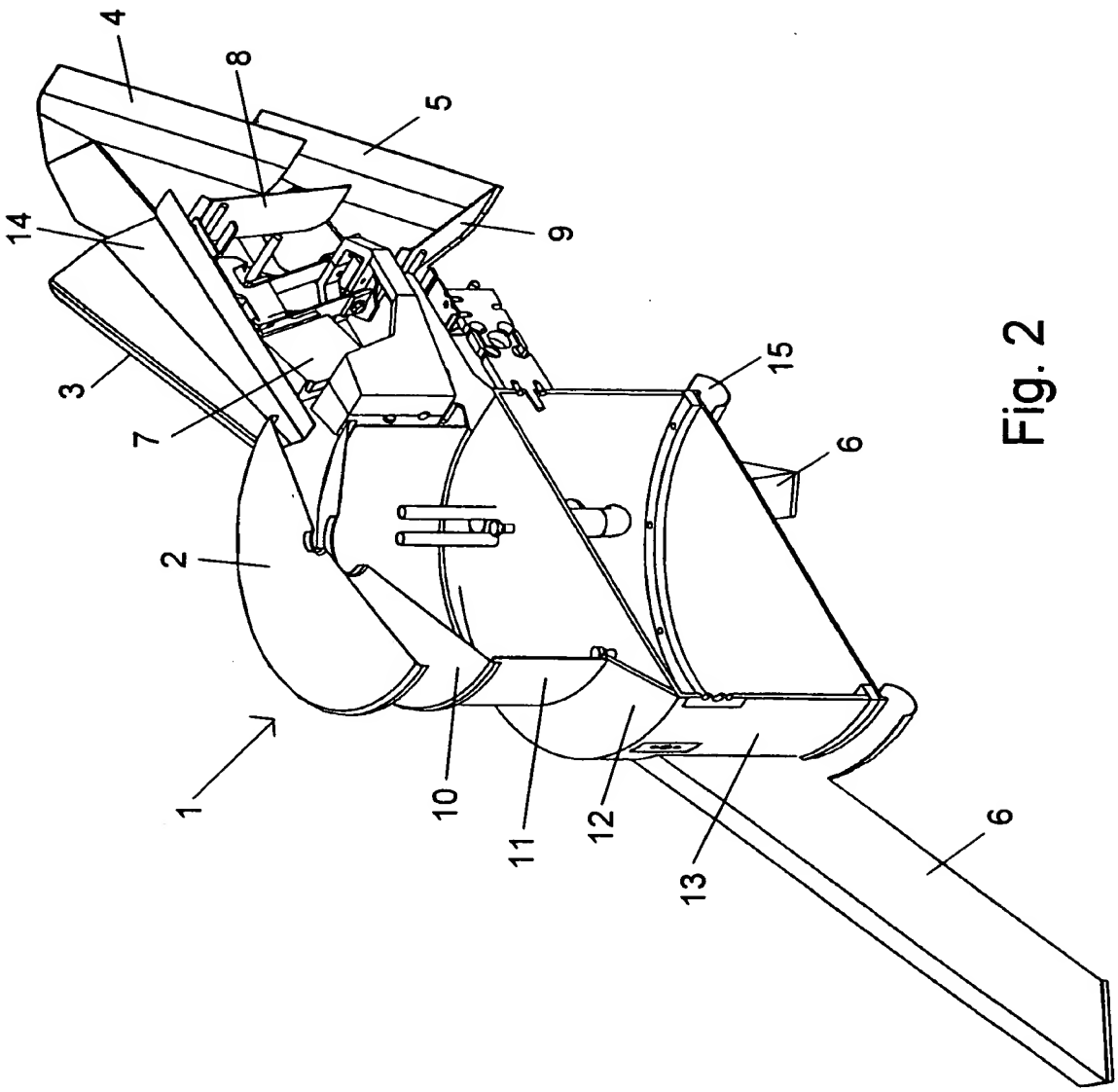

Fig. 2

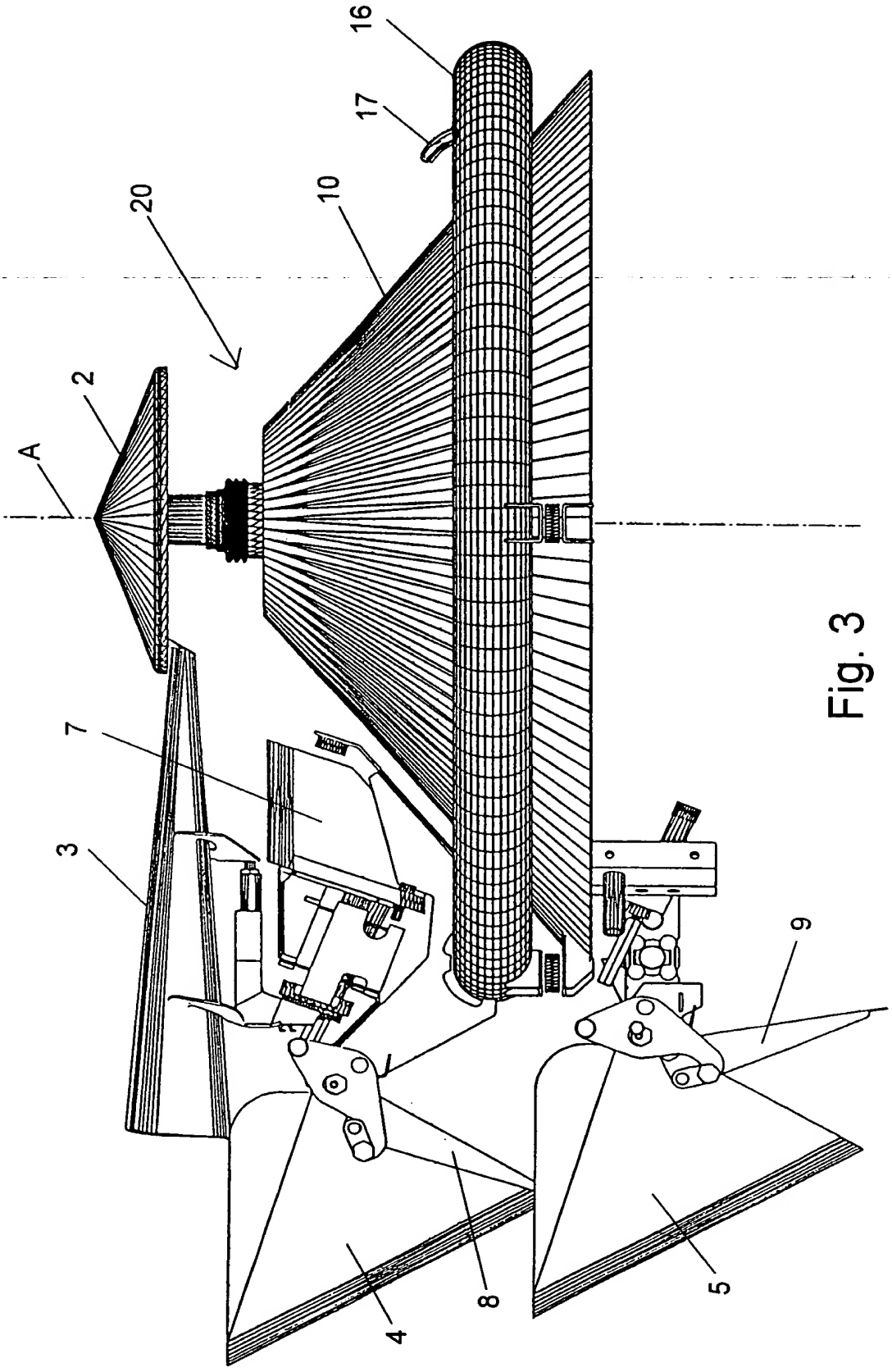

Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK 00/00220

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G01G 13/02, G01G 19/32, G01G 21/28
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: G01G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4683966 A (Y. NAKAGAWA ET AL), 4 August 1987 (04.08.87), column 11, line 43 - line 51, figures 11,12	1-12
A	US 4171067 A (K. FAULKNER ET AL), 16 October 1979 (16.10.79), column 3, line 13 - line 22, figure 3	1-12
A	US 5613590 A (P. SIMIONATO), 25 March 1997 (25.03.97), figure 1, abstract	1-12
A	US 5038875 A (K. KITAGAWA ET AL), 13 August 1991 (13.08.91), abstract, figures 1,9	1-12

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
5 Sept 2000	08 -09- 2000
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Lars Jakobsson/gh Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/DK 00/00220

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4683966 A	04/08/87	AU 575997 B	11/08/88
		AU 4765985 A	27/03/86
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US 5613590 A	25/03/97	NONE	
US 5038875 A	13/08/91	DE 68903820 D,T	01/07/93
		EP 0362567 A,B	11/04/90
		JP 1288174 A	20/11/89
		JP 2167434 A	27/06/90

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only LBW/MLR

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference *(if desired) (12 characters maximum)* P199801562WO

Box No. I TITLE OF INVENTION

A weighing machine

Box No. II APPLICANT

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☐ inventor only *(If this check-box is marked, do not fill in below.)*

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State *(that is, country)* of residence: DK Denmark

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative

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EXPRESS MAIL LABEL NO. EV 011018872 US

Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) *(mark the applicable check-boxes; at least one must be marked)*:

Regional Patent

☒ AP **ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT

☒ EA **Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT

☒ EP **European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT

☒ OA **OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT *(if other kind of protection or treatment desired, specify on dotted line)* .....

National Patent *(if other kind of protection or treatment desired, specify on dotted line)*:

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☒ AL Albania
☒ AM Armenia
☒ AT Austria and Utility Model
☒ AU Australia
☒ AZ Azerbaijan
☒ BA Bosnia and Herzegovina
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☒ DE Germany and Utility Model
☒ DK Denmark and Utility Model
☒ DM Dominica
☒ EE Estonia and Utility Model
☒ ES Spain
☒ FI Finland and Utility Model
☒ GB United Kingdom
☒ GD Grenada
☒ GE Georgia
☒ GH Ghana
☒ GM Gambia
☒ HR Croatia
☒ HU Hungary
☒ ID Indonesia
☒ IL Israel
☒ IN India
☒ IS Iceland
☒ JP Japan
☒ KE Kenya
☒ KG Kyrgyzstan
☒ KP Democratic People's Republic of Korea
☒ KR Republic of Korea
☒ KZ Kazakhstan
☒ LC Saint Lucia
☒ LK Sri Lanka
☒ LR Liberia
☒ LS Lesotho
☒ LT Lithuania
☒ LU Luxembourg
☒ LV Latvia
☒ MA Morocco
☒ MD Republic of Moldova
☒ MG Madagascar
☒ MK The former Yugoslav Republic of Macedonia
☒ MN Mongolia
☒ MW Malawi
☒ MX Mexico
☒ NO Norway
☒ NZ New Zealand
☒ PL Poland
☒ PT Portugal
☒ RO Romania
☒ RU Russian Federation
☒ SD Sudan
☒ SE Sweden
☒ SG Singapore
☒ SI Slovenia
☒ SK Slovakia and Utility Model
☒ SL Sierra Leone
☒ TJ Tajikistan
☒ TM Turkmenistan
☒ TR Turkey
☒ TT Trinidad and Tobago
☒ TZ United Republic of Tanzania
☒ UA Ukraine
☒ UG Uganda
☒ US United States of America
☒ UZ Uzbekistan
☒ VN Viet Nam
☒ YU Yugoslavia
☒ ZA South Africa
☒ ZW Zimbabwe

Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet:

☒ DZ Algeria
☒ AG Antigua and Barbuda

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration f that time limit. *(Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)*

Box No. VI PRIORITY CLAIM ☐ Further priority claims are indicated in the Supplemental Box.

Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is: national application: country	regional application:* regional Office	international application: receiving Office
item (1) 03 May 1999	PA199900599	Denmark		
item (2)				
item (3)				

☐ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) *(only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office)* identified above as item(s): _____

* *Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.*

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) *(if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):*
ISA / SE

Request to use results of earlier search; reference to that search *(if an earlier search has been carried out by or requested from the International Searching Authority):*

Date (day/month/year)	Number	Country (or regional Office)
05 Aug 1999	DK 99/00086	Denmark

Box No. VIII CHECK LIST; LANGUAGE OF FILING

This international application contains the following **number of sheets**:

request	:	3
description (excluding sequence listing part)	:	10
claims	:	3
abstract	:	1
drawings	:	3
sequence listing part of description	:	
Total number of sheets	:	20

This international application is **accompanied by** the item(s) marked below:

1. ☒ fee calculation sheet
2. ☐ separate signed power of attorney
3. ☐ copy of general power of attorney; reference number, if any:
4. ☐ statement explaining lack of signature
5. ☒ priority document(s) identified in Box No. VI as item(s): (1)
6. ☐ translation of international application into (language):
7. ☐ separate indications concerning deposited microorganism or other biological material
8. ☐ nucleotide and/or amino acid sequence listing in computer readable form
9. ☒ other *(specify)*: Copy of DK 99/00086

Figure of the drawings which should accompany the abstract: 1

Language of filing of the international application: Danish

Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

BILWINCO A/S
Flemming Brix
Technical Director

Hans Peter Widmer

For receiving Office use only

1. Date of actual receipt of the purported international application:	2. Drawings: ☐ received: ☐ not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:	
4. Date of timely receipt of the required corrections under PCT Article 11(2):	
5. International Searching Authority (if two or more are competent): ISA /	6. ☐ Transmittal of search copy delayed until search fee is paid.

For International Bureau use only

Date of receipt of the record copy by the International Bureau:

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING SUBMISSION OR TRANSMITTAL OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

To:

HOFMAN-BANG A/S
Hans Bekkevolds Allé 7
DK-2900 Hellerup
DANEMARK

Date of mailing (day/month/year) 19 June 2000 (19.06.00)	
Applicant's or agent's file reference P199801562WO	**IMPORTANT NOTIFICATION**
International application No. PCT/DK00/00220	International filing date (day/month/year) 02 May 2000 (02.05.00)
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 03 May 1999 (03.05.99)
Applicant BILWINCO A/S et al	

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).

2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.

3. An **asterisk(*)** appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

4. The **letters "NR"** appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

Priority date	Priority application No.	Country or regional Office or PCT receiving Office	Date of receipt of priority document
03 May 1999 (03.05.99)	PA 1999 00599	DK	25 May 2000 (25.05.00)

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer

Athina Nickitas-Etienne

Telephone No. (41-22) 338.83.38

EXPRESS MAIL LABEL NO.: EV 011018872 US

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WO 00/66983
PCT/DK00/00220

HEB/UDL

PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

To:
HOFMAN-BANG A/S
Hans Bekkevolds Allé 7
DK-2900 Hellerup
DANEMARK

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

Date of mailing (day/month/year) 09 November 2000 (09.11.00)	
Applicant's or agent's file reference P199801562WO	**IMPORTANT NOTICE**

International application No.	**International filing date** (day/month/year)	**Priority date** (day/month/year)
PCT/DK00/00220	02 May 2000 (02.05.00)	03 May 1999 (03.05.99)

Applicant
BILWINCO A/S et al

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
   AG,AU,DZ,KP,KR,US

   In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:
   AE,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,CA,CH,CN,CR,CU,CZ,DE,DK,DM,EA,EE,EP,ES,FI,GB,GD,
   GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,MN,MW,MX,
   NO,NZ,OA,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,ZA,ZW
   The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on
   09 November 2000 (09.11.00) under No. WO 00/66983

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, **a demand for international preliminary examination** must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the **national phase**, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer J. Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

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PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

INFORMATION CONCERNING ELECTED OFFICES NOTIFIED OF THEIR ELECTION

(PCT Rule 61.3)

To:

HOFMAN-BANG A/S
Hans Bekkevolds Allé 7
DK-2900 Hellerup
DANEMARK

Date of mailing (day/month/year)	
18 April 2001 (18.04.01)	
Applicant's or agent's file reference	**IMPORTANT INFORMATION**
P199801562WO	

International application No.	International filing date (day/month/year)	Priority date (day/month/year)
PCT/DK00/00220	02 May 2000 (02.05.00)	03 May 1999 (03.05.99)

Applicant
BILWINCO A/S et al

1. The applicant is hereby informed that the International Bureau has, according to Article 31(7), notified each of the following Offices of its election:

   AP :GH,GM,KE,LS,MW,SD,SL,SZ,TZ,UG,ZW
   EP :AT,BE,CH,CY,DE,DK,ES,FI,FR,GB,GR,IE,IT,LU,MC,NL,PT,SE
   National :AU,BG,CA,CN,CZ,DE,IL,JP,KP,KR,MN,NO,NZ,PL,RO,RU,SE,SK,US

2. The following Offices have waived the requirement for the notification of their election; the notification will be sent to them by the International Bureau only upon their request:

   EA :AM,AZ,BY,KG,KZ,MD,RU,TJ,TM
   OA :BF,BJ,CF,CG,CI,CM,GA,GN,GW,ML,MR,NE,SN,TD,TG
   National :AE,AG,AL,AM,AT,AZ,BA,BB,BR,BY,CH,CR,CU,DK,DM,DZ,EE,ES,FI,GB,GD,
   GE,GH,GM,HR,HU,ID,IN,IS,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,MW,MX,
   PT,SD,SG,SI,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,ZA,ZW

3. The applicant is reminded that he must enter the "national phase" **before the expiration of 30 months from the priority date** before each of the Offices listed above. This must be done by paying the national fee(s) and furnishing , if prescribed, a translation of the international application (Article 39(1)(a)), as well as, where applicable, by furnishing a translation of any annexes of the international preliminary examination report (Article 36(3)(b) and Rule 74.1).

   Some offices have fixed time limits expiring later than the above-mentioned time limit. For detailed information about the applicable time limits and the acts to be performed upon entry into the national phase before a particular Office, see Volume II of the PCT Applicant's Guide.

   The entry into the European regional phase is postponed **until 31 months from the priority date** for all States designated for the purposes of obtaining a European patent.

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer:
Claudio Borton

Telephone No. (41-22) 338.83.38

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From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and Administrative Instructions, Section 422)

To:

HOFMAN-BANG A/S
Hans Bekkevolds Allé 7
DK-2900 Hellerup
DANEMARK

Date of mailing (day/month/year)
09 November 2001 (09.11.01)

Applicant's or agent's file reference
P199801562WO

IMPORTANT NOTIFICATION

International application No.
PCT/DK00/00220

International filing date (day/month/year)
02 May 2000 (02.05.00)

1. The following indications appeared on record concerning:

[X] the applicant [X] the inventor [ ] the agent [ ] the common representative

Name and Address
WIDMER, Hans, Peter
Ellemosevej 18
DK-8370 Hadsten
Denmark

State of Nationality: DK
State of Residence: DK
Telephone No.:
Facsimile No.:
Teleprinter No.:

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

[ ] the person [ ] the name [ ] the address [X] the nationality [ ] the residence

Name and Address

State of Nationality: CH
State of Residence:
Telephone No.:
Facsimile No.:
Teleprinter No.:

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

[X] the receiving Office
[ ] the International Searching Authority
[ ] the International Preliminary Examining Authority
[ ] the designated Offices concerned
[X] the elected Offices concerned
[ ] other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

Authorized officer
François BAECHLER
Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
P199801562WO		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/DK00/00220	02/05/2000	03/05/1999
International Patent Classification (IPC) or national classification and IPC G01G13/02		
Applicant BILWINCO A/S et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
17/11/2000	09.04.2001
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Baumann, M Telephone No. +49 89 2399 2447

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/DK00/00220

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
Description, pages:

1-10 as originally filed

Claims, No.:

1-12 as originally filed

Drawings, sheets:

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-12
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-12
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-12
	No:	Claims	

2. Citations and explanations
   see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Prior Art

Reference is made to the following documents:

D1: US-A-4683966
D2: US-A-4171067
D3: US-A-5613590
D4: US-A-5038875

Re Item V (Novelty, inventive step or industrial applicability)

1. **Technical Field**

Weighing machine for weighing off bulky materials.

2. **Closest Prior Art**

Document D1, which is considered to represent the most relevant state of the art, discloses a weighing system consisting of a radial distribution table and supply troughs, from where the material is distributed into weighing containers.

3. **Novelty (Article 33(2) PCT)**

The subject-matter of claim 1 differs from D1 in that the weighing machine has a shield made of one or more screen faces arranged below the central distributor and the transporters to protect the machine from spilled material falling into gaps located between the central distributor and the transporters. Whereas in D1, the weighing machine has no shielding means for protecting the apparatus.

The subject-matter of claim 1 is therefore novel.

4. **Inventive Step (Article 33(3) PCT)**

The problem to be solved by the present invention my be regarded as how to protect the weighing apparatus and its components from getting dirty.

The solution to this problem posed in the independent claims 1 of the present application is considered as involving an inventive step, because document D1 shows a weighing machine that has no shielding for avoiding spilled goods to drip of fall into the gaps.

5. **Dependent claims**

Claims 2 to 12 are dependent on claim 1 and as such they also meet the requirements of the PCT with respect to novelty and inventive step.

6. **Industrial applicability (Article 33(4) PCT)**
The application as defined in claims 1 to 12 is doubtless industrially applicable.

7. **Further prior art**
Document D2-D4 disclose different weighing machines for fluid or bulky materials, however do not provide shielding means for protecting the machine and its components.These documents therefore are only of interest as background information.

Re Item VII (Certain defects)

The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Re Item VIII (Certain observations)

Dependent claims 2, 3, 4, 7, 8, 9, 10, 11, and 12 do not meet the requirements of Article 6 PCT due to some minor inconstancies concerning the claim language or inconstancies between the claims and the description.